MEL'TSER, L.Z., kand. tekhn. nauk; DREMLYUKH, T.S., inzh.

Device for the experimental study of the properties of Freon and lubricant mixtures. Khol. tekh. i tekh. no.1:48-53 '65. (MIRA 18:9)

AT7001750 (A) UR/0143/66/000/010/0073/0077

AUTHOR: Martynovskiy, V. S. (Doctor of technical sciences, Professor); Mal'tser, L. Z. (Candidate of technical sciences, Docent); Shnayd, I. M. (Candidate of technical sciences)

ORG: Odessa Technological Institute for the Food and Refrigeration Industries (Odesskiy tekhnologicheskiy institut pishchevoy i kholodil'noy promyshlennosti)

TITLE: Thermal insulation with minimal exoergic losses

SOURCE: IVUZ. Energetika, no. 10, 1966, 73-77

TOPIC TAGS: thermal insulation, entropy, irreversible thermodynamics, heat transfer coefficient, heat conductivity coefficient

ABSTRACT: The magnitude of the exoergic losses, E, in insulation in unit time is determined by the following expression:

$$E = T_s \frac{dS}{dt}, \qquad (1)$$

where T_S is the temperature of the surrounding medium; S is the entropy arising in the insulation; t is the time. Minimal exoergic losses exist in an insulating construction with a minimum rate of entropy formation, dS/dt. In the one-dimensional case considered in the article, the quantity dS/dt is determined by the methods of

Card 1/2

UDC: 662.998

ACC NR: AP7001750

non-equilibrium thermodynamics as

$$\frac{dS}{dt} = F \int_0^l \lambda (T) \left(\frac{i}{T} \cdot \frac{dT}{dx} \right)^2 dx, \qquad (2)$$

where F, l are, respectively, the area and the thickness of the insulating construction; x is a coordinate, calculated in a direction normal to the isothermal planes in the insulation; T is the absolute temperature; λ (T) is the heat conductivity coefficient of the insulation. From the mathematical solution of the above problem, the following conclusions are drawn: 1) the conditions for a minimum in the exoergic losses are a result of irreversible heat transfer in the heat insulation, and are determined by the nature of the heat conductivity coefficient λ (T); 2) if λ does not depend on the temperature, or if it decreases with a decrease in the temperature, the absence of heat removal from the insulation is a necessary condition for the attainment of minimum exoergic losses. Orig. art. has: 15 formulas and 1 figure.

SUB CODE: 11, 20/ SUBM DATE: 29Nov65/ ORIG REF: 003/ OTH REF: 002

Card 2/2

MARTYNOVSKIY, Vladimir Sergeyevich; MEL'TSER, Leonid Zinov'yevich; Prinimali uchastiye: ZHDAN, V.Z., kand. tekhn. nauk; DUDNIK, D.M., inzh.; LEVIT, M.M., inzh.; MART'YANOVA, I.Ya., red.

[Refrigerating plants on ships] Sudovye kholodil'nye ustanovki. Moskva, Transport, 1964. 382 p. (MIRA 17:11)

MEL'TSER, M.M.

Weakly complete continuity of a linear mapping and its conjugate.
Dokl. AN SSSR 152 no.1:50-51 S '63. (MIRA 16:9)

1. Predstavleno akademikom P.S.Novikovym.
(Topology)

MEL'TSER, M.M.

Weakly perfectly continuous spectra of locally convex [illegible].
Dokl. AN SSSR 157 no. 2:265-267 Jl '64. (MIRA 17:7)

1. Moskovskiy gosudarstvennyy [illegible] pedagogicheskiy institut imeni Lenina. Predstavlen akademikom [illegible] Vikovym.

MEL'TSER, N. I.

USSR

/ The effect of streptothricin on the normal microflora of the intestines. V. L. Troitskiĭ, T. A. Sviridova, and N. I. Mel'tser. *Trudy Akad. Med. Nauk S.S.S.R.* 5, *Voprosy Khimioterap. Bakterial. Infektsii*. No. 1, 145–55(1950).— The per os administration of streptothricin to rabbits causes a sharp reduction and in some instances complete elimination of *Escherichia coli* in the intestines. The min. dose which causes a reduction in no. of lactose-fermenting bacteria in the intestine of rabbits is approx. 7000 units/kg.
B. S. Levine

MEL'TSER, R.

Dyeing of leather clothes. Prom.koop. 14 no.3:28 Mr '60. (MIRA 13:7)

1. Starshiy inzhener Nauchno-issledovatel'skogo tekhnokhimicheskogo instituta.
(Dyes and dyeing--Leather)

MEL'TSER, R.A.

Colorimetric analysis of phosphorus in soils and plants. Pochvovedenie no.6:103-106 Je '60. (MIRA 13:10)

1. Moskovskiy gosudarstvennyy universitet.
(Soils—Phosphorus content)

L 18940-65 EWT(1)/EWP(e)/EPA(s)-2/EWT(m)/EPF(n)-2/FCC/EPA(w)-2/T/EEC(b)-2/
EWP(b) Pab-10/Pt-10/Pu-4 IJP(c)/AS(mp)-2/AFWL/ASD(a)-5/ESD(t) WH/GW

ACCESSION NR: AT5001382 S/2778/64/000/012/0084/0088

AUTHOR: Varzhenevskiy, N. S.; Mel'tser, R. A. 21

TITLE: An investigation of the possibility of using electrets in B+I meteorological instruments 12

SOURCE: Leningrad. Nauchno-issledovatal'skiy institut gidrometeorologicheskogo priborostroyeniya. Trudy, no. 12, 1964. Voprosy gidrometeorologicheskogo priborostroyeniya (Problems in hydrometeorological instrument manufacture), 84-88

TOPIC TAGS: electret, meteorological sensor, dielectric, inorganic dielectric, ceramic electret 10

ABSTRACT: Studies conducted during the last several years at the Fizicheskiy institut AN SSSR (Institute of Physics of the Academy of Sciences USSR) have demonstrated that of the several types of electrets being manufactured (thermal, photo, and electric), the electric electrets made from the ceramic dielectric $CaTiO_3$ are the most versatile and the best suited for use as sensors in meteorological instruments. They are capable of retaining an electric charge for approximately

Card 1/2

L 18940-65
ACCESSION NR: AT5001382

three years; disks 3 to 5 mm thick and 30 to 60 mm in diameter, with an internal resistance of 10^{11} to 10^{12} ohms, have a surface charge of 4×10^{-9} to 5×10^{-9} coul/cm^2. Their manufacture, uses, properties, and advantages and disadvantages (for example, a 5-mm thick electret has a fairly high degree of inertia and is, therefore, unsuitable as a humidity sensor) are discussed. Of particular interest to the authors was an electret generator which, without an electric power source, generates and transmits energy over relatively long distances and can be used effectively in remote "anerhumbometers" (for measuring wind speed and direction). Orig. art. has: 1 figure.

ASSOCIATION: Nauchno-issledovatel'skiy institut gidrometeorologicheskogo priborostroyeniya (Scientific Research Institute of Hydrometeorological Instrumentation)

SUBMITTED: 00 ENCL: 00 SUB CODE: ES,EC

NO REF SOV: 004 OTHER: 000 ATD PRESS: 3158

Card 2/2

L 27615-65 EWT(1)/FCC GW

ACCESSION NR: AT5001383 S/2778/64/000/012/0089/0096

12
8
B+1

AUTHOR: Varzhenevskiy, N. S.; Mel'tser, R. A.

TITLE: Investigation of electrolytic humidity sensors

SOURCE: Leningrad. Nauchno-issledovatel'skiy institut gidrometeorologicheskogo priborostroyeniya. Trudy, no. 12, 1964. Voprosy gidrometeorologicheskogo priborostroyeniya (Problems in hydrometeorological instrument manufacture), 89-96

TOPIC TAGS: meteorological instrument, atmospheric humidity, hygrometer, electrolytic sensor, polystyrene, lithium carbide

ABSTRACT: This paper describes a computation method and a method for manufacturing an electrolytic humidity sensor and gives the results of its testing. Electrolytic sensors whose conductivity changes as a function of humidity have been developed before (for example, Dunmore, F. W., Bull. Amer. Met. Soc., v. 19, 225-243, 1938). In the Dunmore instrument, the sensing element is a film of polyvinyl alcohol containing lithium chloride applied to a polystyrene plate. However, this instrument and its Soviet equivalents have certain shortcomings: instability of characteristics with time, a large temperature coefficient and electrode polarization. An effort has therefore been made to find a base which

Card 1/4

L 27615-65

ACCESSION NR: AT5001383

is both moisture-resistant and capable of stably holding a hygroscopic layer. The best such material is polystyrene. The authors have therefore devised and described a new sensor shown schematically in Fig. 1 of the Enclosure. Aging of the sensor in a humidity chamber at humidities of 15-100% is described. It was found that the concentration of LiC in the polystyrene determines the range of measured humidity. The authors present curves for models of polystyrene sensors with LiC concentrations from 0.14 to 1.65%. When the LiC concentration is greater than 1.65% the sensitivity of the polystyrene sensors decreases sharply at high humidities; the best concentration is 1.4-1.6%. Inertia data for this sensor are given. For example, when the rate of ventilation is 1 m/sec. the inertia coefficient decreases by a factor of approximately 6 in comparison with a calm; when the rate of ventilation is 5 m/sec. -- by more than a factor of 10. These sensors still show a temperature effect and should be used only at above-zero temperatures and when fluctuations in temperature are small. The influence of polarization can be eliminated by connection to an alternating current. Stability of the new instrument is superior to that of electrolytic instruments now in use. Orig. art. has: 8 formulas, 3 figures and 5 tables.

Card 2/4

L 27615-65
ACCESSION NR: AT5001383

ASSOCIATION: Nauchno-issledovatel'skiy institut gidrometeorologicheskogo priborostroyeniya, Leningrad (Hydrometeorological instrument making scientific research institute)

SUBMITTED: 00 ENCL: 01 SUB CODE: ES

NO REF SOV: 006 OTHER: 004

Card 3/4

L 27615-65
ACCESSION NR: AT5001383

ENCLOSURE: 01

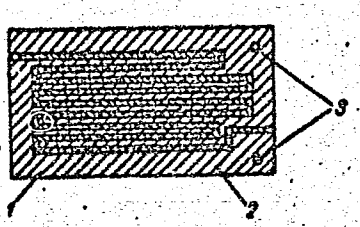


Fig. 1. Schematic diagram of the sensor:
1) hygroscopic polystyrene;
2) current-conducting layer;
3) openings for attachment and electrical connection of the sensor

Card 4/4

KHASHKOVETS, Irzhi[Haskovec, Jiri], inzh.; KOTEK, Zdenek, inzh.; MEL'TSER, R.Ye.[translator]; SINCHUK, B.I., nauchnyy red.; KLIMOVICH, Yu.G., red.; TOKER, A.M., tekhn. red.

[Small-scale automation]Malaia avtomatizatsiia. Moskva, Profteknizdat, 1961. 197 p. Translated from the Czech. (MIRA 15:7)

(Automation)

CHERNOKH, S.[Cernoch,S.]; SHVARTS, V.V.[translator]; MEL'TSER, R.Ye.[translator]; GOL'DSHTEYN, M.S.[translator]; DULA, I.Ya.[translator]; SHVARTS, I.V.[translator]; YAKUBOVICH, L.V.[translator]; ACHERKAN, N.S., prof., doktor tekhn. nauk, red.; GIL'DENBERG, M.I., red.izd-va; TIKHANOV, A.Ya., tekhn. red.

[Handbook on the manufacture of machinery in two volumes] Spravochnik po mashinostroeniiu v dvukh tomakh. Moskva, Mashgiz, Vol.1. 1963. 734 p. Translated from the Czech. (MIRA 16:12)

(Mechanical engineering) (Metalwork)

MEL'TSER, Vladimir Gil'yevich; YELIZ'YEV, M.Ye., red.

[Electron tubes with secondary emission and their applications] Lampy s vtorichnoi emissiei i ikh primenenie. Moskva, Izd-vo "Energiia," 1964. 23 p. (Massovaia radiobiblioteka, no.514) (MIRA 17:6)

L 56189-65

ACCESSION NR: AP5017808 UR/0286/65/000/011/0041/0041
621.375.132.3

6
B

AUTHOR: Mel'tser, V. G.

TITLE: A cathode follower. Class 21, No. 171438

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 11, 1965, 41

TOPIC TAGS: secondary emission, cathode follower, electronic circuit

ABSTRACT: This Author's Certificate introduces a cathode follower based on a tube with secondary emission. The input capacitance of the follower is reduced by connecting a feedback condensor between the screen grid and diode of the tube.

ASSOCIATION: Organizatsiya gosudarstvennogo komiteta po radioelektronike SSSR (Organization of the State Committee for Radio Electronics SSSR)

SUBMITTED: 24Dec62 ENCL: 01 SUB CODE: EC

NO REF SOV: 000 OTHER: 000

Card 1/2

L 56489-65

ACCESSION NR: AP5017808

0

ENCLOSURE: 01

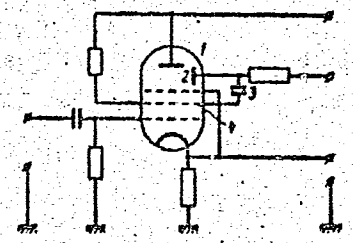


Fig. 1--tube with secondary emission; 2--tube diode; 3--feedback condensor; 4--screen grid

Card 2/2

137-1958-3-4984

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 3, p 74 (USSR)

AUTHORS: Mel'tser, V. V., Pavlov, I. M., Tyukalov, P. A.

TITLE: Establishment of an Operational Scheme for the Loop Holders of a Mill for Hot Rolling of Thin Sheet Metal (Ustanovleniye rezhima raboty petlederzhateley tonkolistovogo stana goryachey prokatki)

PERIODICAL: Sb. nauchn. tr. Magnitogorskiy gornometallurgich. in-t, 1957, Nr 11, pp 214-224

ABSTRACT: An optimal operational scheme was established for the power transmission system of the loop holders, the sluggish action of which in raising the lever had been responsible for the elongation of the strip and breakage of the shaft of the reduction unit. The effect of the voltage on the torque of the motor was determined, together with the relationship between the strip tension and the voltage and the elevation angle of the lever. The relationship between the voltage and the time required for the elevation of the loopholder lever was also determined. In order to eliminate deficiencies in the operation of the power system actuating the loop holders, it is suggested that the gear ratio of the reduction unit be reduced from 24.26 to 7.8 and that the supply voltage

Card 1/2

Establishment of an Operational Scheme for the Loop Holders (cont.)

at the motor be increased from 8-9 v to 15-18 v, which should reduce the time required for the raising of the loopholder lever to 1.5 - 1.8 seconds.

P. G.

S/137/61/000/007/015/072
A060/4101

AUTHORS: Nosov, V. D.; Mel'tser, V. V.; Pratusevich, A. Ye.

TITLE: Improvement of the technology and operation of the continuous thin-sheet hot rolling mill 1450

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 7, 1960, 5, abstract 7D30 ("Tr. Konferentsii: Tekhn. progressa v tekhnol. prokatn. proiz-va". Sverdlovsk, Metallurgizdat, 1960, 476-485)

TEXT: The grading of the mill 1450 and the plant equipment are described. The extent of increase in the power and working capacity of the following sections of the shop are enumerated: the slab store, rolling mill, removing part of the mill. The measures required for improving the technology and increasing the service life of the equipment are indicated.

V. Mezis

[Abstracter's note: Complete translation]

Card 1/1

S/133/62/000/008/001/003
A054/A127

AUTHORS: Medvedev, G.A.; Faynberg, L.B.; - Engineers; Mel'tser, V.V., Candidate of Technical Sciences

TITLE: The effect of the hot-rolling technology on the properties of sheets for deep drawing

PERIODICAL: Stal', no. 8, 1962, 732 - 737

TEXT: Hot rolled 08 кп (08kp) and 10 кп (10kp) sheets should be suitable for deep drawing without having to undergo additional heat treatment. The properties and, especially, relative elongation of sheets depend to a great extent on the grain size which, in turn, is affected by the temperature at the end of rolling and during cooling of the strips. The effect of the first factor on the grain size was studied on the 1450 mill of the Magnitogorskiy metallurgicheskiy kombinat (Magnitogorsk Metallurgical Combine) with samples of 08 кп ВГ (08kpVG) car sheets, 2.5 - 3.5 mm thick, at various temperatures and specific reduction on the last stand of 6 - 9% and with intensive water-spray cooling. Raising the temperature at the end of rolling from 800 to 880°C gradually increases the

Card 1/3

yield of flawless sheets to grain size from 52.3 to 100%. A higher end temperature of rolling also improved the mechanical characteristics, including relative elongation. However, the required end temperature of 880 - 890°C for sheets 2 - 2.5 mm thick is difficult to obtain. Therefore, other factors also affecting the grain size (cooling and reduction) have to be taken into consideration as well. Grain growth can be checked by intense cooling prior to coiling the strips. Cooling the strips by intense water spraying will also promote the removal of cinder during pickling. Tests carried out on the 1680 mill of the zavod "Zaporozhstal'" ("Zaporozhstal' Plant) yielded an optimum temperature range of 620 - 650°C for the strip prior to coiling. With such intensive cooling the grain structure of the sheet will be homogeneous over its entire cross section, whereas insufficient cooling causes the larger grains to concentrate at the surface and the smaller ones in the center of the cross section. The third factor greatly affecting the grain size is the degree of reduction on the last stand. Adequate tests were carried out with 08kpVG sheets 2 mm thick. At approximately identical rolling temperatures the most homogeneous grain structure and a higher value of relative elongation were obtained when the reduction on the last stand was increased to 16 - 18%. In this case, relative elongation over the entire

Card 2/3

length of the strip was above 30%, while at reductions of 8.5% this parameter did not even come up to the standard. Higher reductions, however, increase the risk of warping. This can be prevented by ensuring the right convexity of the work rolls, by cooling the roll barrels lengthwise and by frequently changing the finishing stand. All three factors determining the grain size must be applied in combination. If, for instance, only the reductions are increased to 13 - - 13.5% while the end temperature of rolling is not raised above 820 - 840°C and water-spray cooling is not effective enough, a large-sized grain structure and a low value of relative elongation will be the result. Optimum conditions are obtained with an end temperature of rolling of 840 - 900°C beyond the last stand (i.e., 865 - 925°C at the beginning of the process), a temperature of 650°C during coiling and a reduction on the last stand of 15 - 17%. Cooling can be intensified by increasing the spraying surface of the cooling installation and the water pressure. The tests were carried out in cooperation with G.V. Mezentsev, A. Gabbasova and A.N. Tupikina. There are 5 figures and 2 tables.

ASSOCIATION: Magnitogorskiy metallurgicheskiy kombinat (Magnitogorsk Metallurgical Combine)

MEL'TSER, V.V., dotsent, kand.tekhn.nauk; PRATUSEVICH, A.Ye., inzh.; KSENZUK, F.A., inzh.; LEDKOV, V.G., inzh.

"Hot sheet rolling on continuous and semicontinuous mills" by M.M.Saf'ian. Reviewed by V.V.Mel'tser and others. Stal' 22 no.9:832-834 S '62. (MIRA 15:11)

1. Magnitogorskiy gornometallurgicheskiy institut i Magnitogorskiy metallurgicheskiy kombinat (for Mel'tser, Pratusevich). 2. Zavod "Zaporozhstal'" (for Ksenzuk, Ledkov).
(Rolling (Metalwork)) (Saf'ian, M.M.)

MEL'TSER, V.V.

MEL'TSER, V.V., dotsent; PRATUSEVICH, A.I., inzhener.

"Continuous sheet rolling mill for hot rolling" by M.M. Saf'ian. Reviewed by V.V. Mel'tser, A.E. Pratusevich. Stal' 17 no.6:552-553 Je '57. (MLRA 10:7)

1. Magnitogorskiy gorno-metallurgicheskiy institut in Magnitogorskiy kombinat.
(Rolling mills) (Saf'ian, M.M.)

FAYZULLIN, V.Kh.; MEL'TSER, V.V.; GALEYEV, I.; FAYNBERG, L.B.; MIROSHNIKOV, I.K.

Effect of the initial shape of working rolls of continuous mill finishing stands on the shape of the rolled strip section. Stal' 23 no.7:624-627 Jl '63. (MIRA 16:9)
(Rolling (Metalwoork)) (Rolls (Iron mills))

BOYARSHINOV, M.I.; MEL'TSER, V.V.

Negative advancing during rolling. Izv. vys. ucheb. zav.: chern. met. 7 no.9:106-112 '64. (MIRA [illegible]

1. Magnitogorskiy gorno-metallurgicheskiy institut.

MEL'TSER, V.V.; PYZHENKOV, I.A.

Matrix method of calculating the grooving of rolls for four-high rolling mills. Izv. vys. ucheb. zav.; chern. met. 8 no.10:94-100 '65. (MIRA 18:9)

1. Magnitogorskiy gornometallurgicheskiy institut.

MEL'TSER, Ya.D., Cand Tech Sci -- (diss) "Study of the technological process of harvest of grain cultures in drained marsh-peat soils." Minsk, 1958, 18 pp (Acad Sci BSSR. Department of Phys Math and Tech Sci) 150 copies (KL, 50-58, 125)

ELIASHBERG, Amaliya Yakovlevna; BARANOVA, Inna Petrovna; MEL'TSER, Yevgeniya Mikhaylovna, kand.filol.nauk; RUBTSOVA, Nina Nikolayevna; GRABOVSKIY-ZKONOPNITS, V.A., kand.tekhn.nauk, red.; YEVSYUKOV, Yu.M., red.; BRUDNO, K.F., tekhn.red.

[English-Russian dictionary of terms used in the woodpulp and paper industries] Anglo-russkii slovar' po tselliulozno-bumazhnomu proizvodstvu. Pod red. V.A.Grabovskogo-Zkonopnits. Moskva, Gos. izd-vo fiziko-matem.lit-ry, 1958. 263 p. (MIRA 12:4)
(English language--Dictionaries--Russian)
(Paper industry--Dictionaries) (Woodpulp industry--Dictionaries)

MEL'TSER, Yevgeniya Mikhaylovna, kand.filol.nauk; ANDRONNIKOVA, Yelena Mikhaylovna; KNYAZYATOVA, Lyudmila Ivanovna; GRABOVSKIY-ZKONOPNITS, V.A., kand.tekhn.nauk, red.; POGREBNAYA, L.L., red.; MURASHOVA, N.Ya., tekhn.red.

[German-Russian dictionary of the paper industry] Nemetsko-russkii slovar' po tselliulozno-bumazhnomu proizvodstvu. Sostavili: E.M. Mel'tser, E.M.Andronnikova i L.I.Kniaziatova. Red. V.A.Grabovskii-Zkonopnits. Moskva, Gos.izd-vo fiziko-matem.lit-ry, 1959. 235 p. (MIRA 12:4)

(German language--Dictionaries--Russian)
(Paper industry--Dictionaries)

MEL'TSER, Ya.M., kand.filologicheskikh nauk; ELIASHBERG, A.Ya., starshiy prepodavatel'; ANDRONNIKOVA, Ye.M., prepodavatel'

Analyzing the terminology of the pulp and paper industry; from English and German sources. Trudy LTITSBP no.8:200-208 '61. (MIRA 16:9)

(Paper industry--Terminology)

MEL'TSER, Ye.M., kand. filol. nauk; ELIASHBERG, A.Ya.; GRABOVSKIY-ZKONOPNITS, V.A., kand. tekhn. nauk, red.

[Russian-English-German-French dictionary of wood technology; paper and timber] Lesotekhnicheskii russko-anglo-nemetsko-frantsuzskii slovar'; po bumage i lesu. Pod red. V.A. Grabovskogo-Zkonopnita. Moskva, Lesnaia prom., 1964. 423 p. (MIRA 17:9)

[illegible], I. [illegible].

[illegible], I. [illegible]: "[illegible] radioactive [illegible] content-free [illegible] of [illegible] select [illegible]." Akad. Nauk SSSR. Inst. [illegible]. Moskva, [illegible]. (Dissertation [illegible] Sciences).

SO: Kniz[illegible] Zurnal'nykh [illegible]

SOV/124-57-9-10732

Translation from: Referativnyy zhurnal. Mekhanika, 1957, Nr 9, p 128 (USSR)

AUTHOR: Mel'tser, L. V.

TITLE: On the Employment of Radioactive Methods for Automatic Control of the Discharge Rate and Dust Content of Gaseous Media (O primenenii radioaktivnykh metodov dlya avtomaticheskogo kontrolya raskhoda i zapylennosti gazovykh sred)

PERIODICAL: Sb. rabot po avtomatike i telemekhan. Moscow, AN SSSR, 1956, pp 211-227

ABSTRACT: The author examines the possibility of producing an ion cloud with the aid of a modulated radioactive emission and gives a preliminary evaluation of measuring devices employed for automatic control of the discharge rate of a gas (by the pulse and phase methods) and regulation of the degree of its contamination with dust by the method of ionic-cloud migration. After entering the pipe line the modulated radioactive emission forms packets of ions which, after being carried by the flow to a collector situated at a lower point along the pipe line, produce a current in the collector circuit. One of the many possible versions of block diagrams for measuring devices

Card 1/3

On the Employment of Radioactive Methods for Automatic Control (cont.)

is given for each method. Processes of the formation and transfer of ionic packets are described together with the processes connected with the appearance of a potential at the input of the amplifier. An analysis of the operation of a unit for automatic control of gas discharge rate demonstrates that if an α-source with an activity of 1 millicurie is employed for a solid angle of 0.15 and an irradiation period of 100 μ-seconds (the diameter of the pipe being 8-10 cm), the number of pairs of ions, in the case of air, will amount to approximately 8×10^6. The total number of ions at the collector point, taking into account their recombination during periods of migration of 50 and 5 microseconds, will amount to 10^5 and 2.5×10^5, respectively. It is pointed out that for identical values of the pipe diameter and the magnitude of the solid angle, the activity of a β-source must be 2.5 times that of an α-source. The author also examines the problem of the employment of radioactive isotopes permitting one to combine determination of the degree of dust contamination of a gas flowing through a pipe with concurrent measurement of its discharge rate by means of the method of electrical discharge for ionization. The discharge unit and the α-isotope are located within the pipe. The input voltage of the discharge unit is so chosen that a discharge occurs only when an α-particle enters the region between the electrodes of the unit. At a specified distance between the discharge unit and the α-source, the appearance of liquid or solid impurities

On the Employment of Radioactive Methods for Automatic Control (cont)

shortens the path of the α-particles and, consequently, reduces the number of discharges per unit of time. A quantitative evaluation of the processes observed during the measurement of dust contamination is given in the case of a device employing α-particles. It is noted that, owing to their low ionization capacity, β and γ emissions may not be used for these purposes. Bibliography: 13 references.

V. S. Merkulov

Card 3/3

MELTSER, L.V

20(6), AUTOMATIC MEASURING OF GAS FLOW BY THE "LABELLED MOLECULES" METHOD. Shumilovskii, N.N. and Meltser, L.V. (Priborostroenie (Izmeritel'naya Tekhnika, U.S.S.R.), 1956, (5), 6-10; contr. in Ref. Zh. Khim. (Ref. J. Chem., Moscow), 1956, (24), 78035). The method consists in the registration of ionic "labels" (or "labelled molecules") formed in the gas by the action of modulated radioactive radiation from a source outside the gas pipe. The method is applicable to cases in which the duration of a process is no longer than the duration of total recombination of the ionic label. The ionizing radiation is selected to suit the wall thickness and diameter of the pipe and the gas pressure. The use of beta rays enables the making of thin windows in the pipe walls to be avoided and electromagnetic modulation to be used for the ionizing beam. The ionic labels are caught by a collector connected to the inlet to the amplifier. The impulse coming from the amplifier to the timing mechanism is delayed, in relation to one coming from the modulator, to an extent that is proportional to the gas velocity. The scale of the indicating instrument is graduated in units of gas flow and is almost linear. Errors do not exceed 1.5 to 2%, provided there is a scheme of calibration which eliminates the effects of variations in the supply voltage and of the valve characteristics.

pml MA

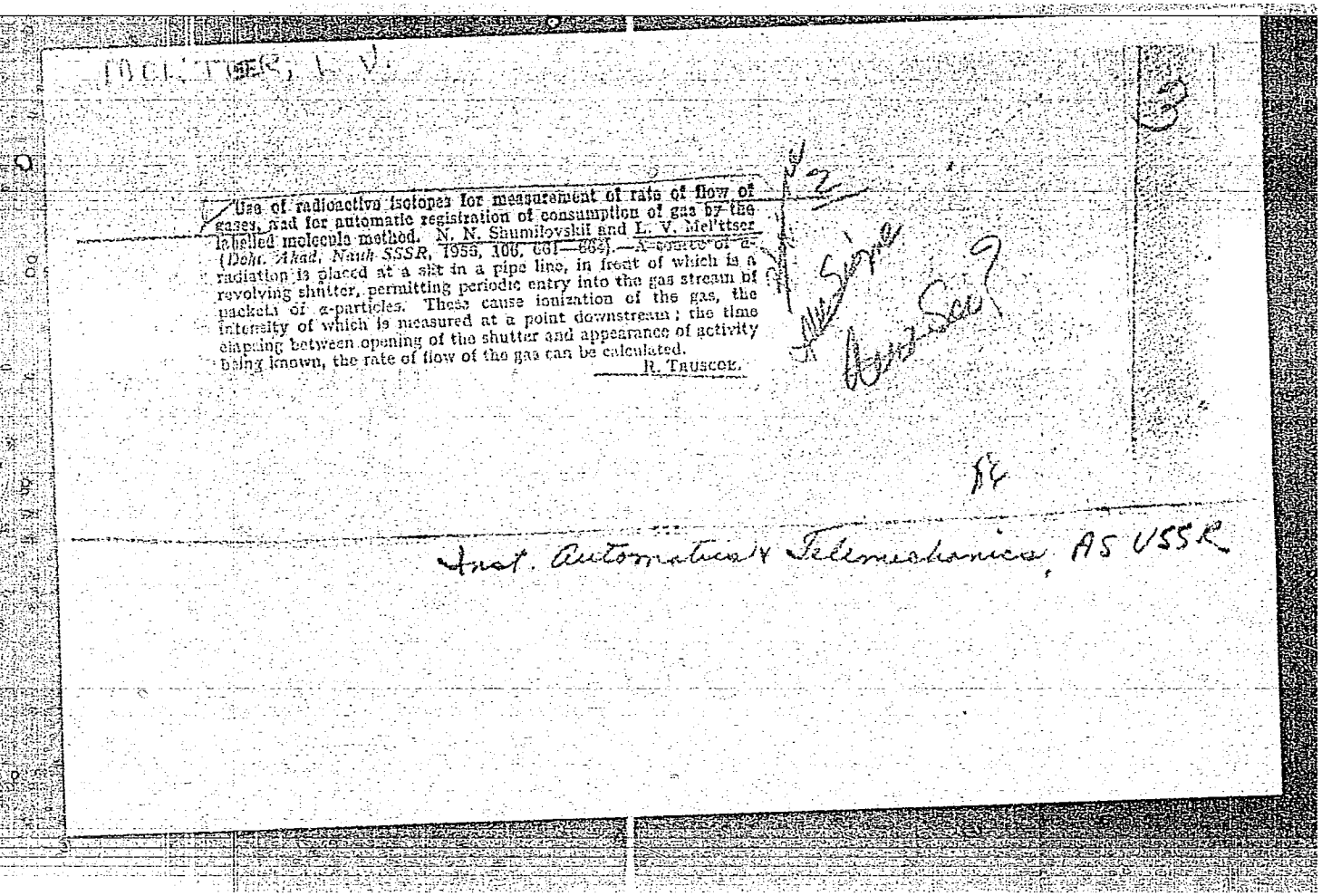
MEL'TSER, L.V.

4

Engineering design calculations for flowmeters working on the principle of tagged molecules. N. N. Slonimovskii and L. V. Mel'tser. *Priborostroenie* 1956, No. 11, 4-8; cf. *ibid.* 8-11.—The engineering design calcns. and electronic circuits used in the construction of a gas flowmeter are presented. The gas passes close to a β-ray source, which causes ionization of the gas. The extent of ionization is related to the speed of the passing gas and can be measured electronically.

Vincent E. Bower

KHS
MT



MELTTSER, L. V.

Use of radioactive isotopes for measurement of rate of flow of gases, and for automatic registration of consumption of gas by the labelled molecule method. N. N. Shumilovskii and L. V. Mel'ttser. (*Dokl. Akad. Nauk SSSR*, 1955, 100, 661—664).—A source of α-radiation is placed at a slit in a pipe line, in front of which is a revolving shutter, permitting periodic entry into the gas stream of packets of α-particles. These cause ionization of the gas, the intensity of which is measured at a point downstream; the time elapsing between opening of the shutter and appearance of activity being known, the rate of flow of the gas can be calculated.

R. Trusdell.

Inst. Automatics & Telemechanics, AS USSR

AUTHOR: Mel'tser, L.V. 115-5-20/44

TITLE: Measuring Gas Flow by Ionization Methods (Ionizatsionnyye metody izmereniya raskhoda gaza)

PERIODICAL: "Izmeritel'naya Tekhnika", No 5, Sep-Oct 1957, pp 43-47 (USSR)

ABSTRACT: The article presents general information in concise form on the principles of the existing methods of measuring gas flows which utilize electrical discharge or radioactivity. The review is made with references to Russian authors' certificates and dissertations, and with references in English. The method of "marked molecules", developed in 1955 at the Institute for Automatics and Telemechanics of the USSR Academy of Sciences is described. The advantages of this method are claimed to be the following: measurement error of 1% or less, no discharges into the gas stream, stability of measurements, determination of mean speed, readily automated work, no contamination of stream and no consumption of isotopes, convenience of observations. The method is applicable only when the measured time of movement of the mark is considerably shorter than the time to the full disappearance of the mark.

Card 1/2

Measuring Gas Flow by Ionization Methods 115-5-20/44

The article contains 6 diagrams and 18 references, 11 of which are Russian.

AVAILABLE: Library of Congress

Card 2/2

MEL'TTSER L.V.

28-6-9/40

AUTHORS: Shumilovskiy, N.N., Professor, Doctor of Technical Sciences and Mel'ttser, L.V., Candidate of Technical Sciences.

TITLE: Production Quality Control by Radioactive Means (Kontrol' kachestva produktsii radioaktivnymi metodami)

PERIODICAL: Standartizatsiya, 1957, # 6, pp 31 - 37 (USSR)

ABSTRACT: This is a general review of existing industrial radioisotope measurement methods and instruments for the following uses: automatic control of the thickness of rolled metal in the process of rolling: gamma-ray defectoscopy; inspection of metal coating quality; automatic quality control of paper and fabrics in the production process; quality inspection of leather and furs, of coal, of soil, of refractories; automatic control of density and concentration of liquids; automatic quality control of various production with the use of radioactive relay.

The information includes the names of the USSR scientific institutes and plants who devised and built the instruments, the work principles of the instruments, their technical characteristics and some names of plants where the instruments are used.

There are 7 figures and 25 references, 23 of which are Russian

Card ~~1/2~~

MEL'TTSER, L V

SOV/81-59-19-68180

Translation from: Referativnyy zhurnal. Khimiya, 1959, Nr 19, p 249 (USSR)

AUTHORS: Shumilovskiy, N.N., Mel'ttser, L.V.

TITLE: The Principal Trends in the Application of Radioactive Isotopes in Automatic Control Installations

PERIODICAL: Tr. In-ta fiz. AN LatvSSR, 1957, Vol 10, pp 5 - 22

ABSTRACT: The advantages of installations of automatic control are emphasized, which are based on the utilization of radiation from radioactive isotopes. The following principal trends in the present and future application of radioactive isotopes in the measuring technique are considered: 1) the use of the penetration property of radioactive radiation and the measuring of the degree of its absorption or reverse scattering by the controlled substance; 2) the use of the effect of ionization of the controlled substance under the action of radioactive radiation; 3) the use of the methods of spectroscopy of radioactive radiation for the control of the composition of complex substances. The attention is drawn to the expediency of broad application of neutron radiations.

A. Drobiz

Card 1/1

MEL'TTSER

AUTHOR AGEYKIN D.I., MEL'TTSER L.V., SHUMILOV I.N.

TITLE Modulation of Radioactive Radiation in Automatic Control Devices. (Modulyatsiya radioaktivnogo izlucheniya dlya ustroystv avtomaticheskogo kontrolya. Russian)

PERIODICAL Avtomatika i Telemekhanika, 1957, Vol 18, Nr 7, pp 686-688 (U.S.S.R.)

ABSTRACT Various modulation methods are investigated. Fundamentally, two kinds of them are possible: mechanic modulation and modulation by means of a field. The most simple case of a modulated element in the case of mechanic modulation is an aperture. This case is investigated here and formulae for the determination of its thickness are deduced. Another possibility is the use of a small electromagnetic vibrator. The presence of movable parts in the modulator is the disadvantage of mechanic modulation. Modulation by means of a field is only possible with alpha- and beta -rays. The fundamental scheme of such a modulation is shown and the deflections are calculated. Form these calculations we see that only the modulation of beta rays can be easily realized in practice. The authors built a magnetic modulator for beta-radiation with an induction of 0-2000 Gs in the operating aperture. A radioactive isotope of thallium 204 with an activity of 30 mCu was placed between the poles of a small magnet. The experiment showed that this modulator is hardly suitable for the production of small radiation impulses but that it served excellently in cases where it was necessary gradually to change the intensity of radiation at

Card 1/2

Modulation of Radiative R[illegible]ion in Ammonia [illegible]
Devices

the modulator output. Mechanic modulation is used for [illegible]
tion of short [illegible]pulses with abrupt fro[illegible]
(2 illustrations and 5 Sl[illegible]. refer[illegible]

ASSOCIATION Not Given.
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SUBMITTED 4.9.1956
AVAILABLE Library of Congress.
Card 2/2

MELTTSER, L.V.

AUTHORS Gushchin, Yu.V., Melttser, L.V., Tolokonnikov, M.I., 103-9-5/9
Shumilovskiy, N.N. (Moscow)

TITLE The Application of Radioactive Radiation in Automatic Control Devices.
(Primeneniye radioaktivnykh izlucheniy v ustroystvakh avtomaticheskogo kontrolya.-Russian)

PERIODICAL Avtomatika i Telemekhanika, 1957, Vol 18, Nr 9, pp 814-840 (U.S.S.R.)

ABSTRACT Material for a far-reaching utilization of nuclear radiation in automatic control devices in the USSR is dealt with. A survey is given and also an analysis of the typical methods of using these devices. First, the basic characteristics of α-ß- and γ-radiation are investigated and described. Next, the most frequently used reception devices for the transformation of radioactive radiation energy into electric energy, such as the ionization chamber, the Geiger-Mueller counter, and scintillating counters are described. There follows a description of the automatic control of the thickness and the weight of working materials, medium density, etc., on which occasion several compensation systems are described and various control devices in the coal-, textile-, paper-, fur-, milk-, leather-, and other industries are enumerated. The methods of controlling and regulating gas- and liquid consumption, the devices for the automatic recording of the presence of admixtures in the gas, devices for the automatic control and regulation of gas pressure, relay systems with the application of contact-less radioactive relays, and the further development of

Card 1/2

The Application of Radioactive Radiation in Automatic 103-9-5/9
Control Devices.
the method of automatic control ane described.
There are 25 figures and 46 Slavic references.

SUBMITTED September 4,1956
AVAILABLE Library of Congress
Card 2/2

MELITTSER, L.V.

21(6)

Sponsoring Agency: [illegible] po ispol'zovaniyu atomnoy energii, and Akademiya nauk SSSR.

Editorial Board of Sci. Ed. Pub.: V.I. Dikarkin, Academician (Resp. Ed.), M.M. Shanilovskiy (Deputy Resp. Ed.), Yu. S. Zaslavskiy (Deputy Resp. Ed.), L.K. Tatochenko, B.I. Verkhovskiy, S.T. Kazarov, L.I. Petrenko and N.G. Zelvinskaya (Secretary).

Ed. of Publishing House: P.N. Belyanin; Tech. Ed.: T.P. Polenova.

PURPOSE: This book is intended for specialists in the field of machine and instrument manufacture who use radioactive isotopes in the study of materials and processes.

COVERAGE: This collection of papers covers a very wide field of the utilization of tracer methods in industrial research and control in the machine- and instrument-manufacturing industry. The individual papers discuss the applications of radioisotope techniques in the study of metals and alloys, problems of friction and lubrication, metal cutting, engine performance, and defects in metals. Several papers are devoted to the use of radioisotopes in the automation of industrial processes, recording and measuring devices, quality control, flowmeters, level gauges, safety devices, radiation counters, etc. These papers represent contributions of various Soviet institutes and laboratories. They were published as Transactions of the All-Union Conference on the Use of Radioactive and Stable Isotopes And Radiation in the National Economy and Science, April 4-12, 1957. No personalities are mentioned. References are given at the end of most of the papers.

MEL'TTSER, L V

21(4), 28(1) PHASE I BOOK EXPLOITATION SOV/1571

Shumilovskiy, Nikolay Nikolayevich, and Lel' Vladimirovich Mel'ttser

Primeneniye yadernykh izlucheniy v ustroystvakh avtomaticheskogo kontrolya tekhnologicheskikh protsessov (Application of Nuclear Radiation in Automatic Control of Production Processes) Moscow, Gosenergoizdat, 1958, 95 p. (Series: Biblioteka po avtomatike, vyp. 1) 13,000 copies printed.

Editorial Board: I.V. Antik, S.N. Veshenevskiy, V.S. Kulebakin, A.D. Smirnov, B.S. Sotskov, Ye.P. Stefani, N.N. Shumilovskiy; Ed.: G.G. Iordan; Tech. Ed.: N.I. Borunov.

PURPOSE: The book is intended for engineers, technicians, and senior students of vuzes who are not specializing in nuclear physics and who intend to work in the field of complex automatic process control.

COVERAGE: The book discusses the basic properties of nuclear radiation and radiation meters employed in automatic control systems. It presents examples of specific systems used in industry and describes their principle of construction. The application of nuclear radiation in industry was discussed at the All-Union Scientific and Technical Conference on the Use of Radioactive

Card 1/4

Application of Nuclear (Cont.)

and Stable Isotopes and Radiation in the National Economy, held in Moscow in April, 1957. Its use in automatic process control resulted in large savings in labor and material. Examples of such applications in Soviet industry are discussed, with particular reference to the following plants: Leningradskiy staleprokatnyy zavod, "Zaporozhstal'", and Fabrika imeni Nogina (in Kuntsevo). The book is the first in a series entitled "Biblioteka po avtomatike" (A Library on Automation), which will be devoted to problems of automatic process control. No personalities are mentioned. There are 66 references of which 62 are Soviet (including 1 translation), and 4 English.

TABLE OF CONTENTS:

Application of Nuclear (Cont.)

AVAILABLE: Library of Congress

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Card 4/4

SHUMILOVSKIY, N. N., MELTSER, L. V.

"Wege des Aufbaus von Messschaltungen in den auf der Benutzung radioaktiver Isotope beruhenden automatischen Kontrollvorrichtungen"

report presented at the Intl. Measurements Conference (IMEKO) Budapest, 24-30 November ~~1960~~ 1958

MEL'TTSER, L.V.

PHASE I BOOK EXPLOITATION SOV/1606

26(1)

Akademiya nauk SSSR. Institut avtomatiki i telemekhaniki

Avtomatika i telemekhanika; sbornik (Automation and Telemechanics; Collection of Articles) Moscow, Izd-vo AN SSSR, 1958. 144 p. 5,000 copies printed.

Resp. Ed.: Ya.Z. Tsypkin; Ed. of Publishing House: V.A. Kotov; Tech. Ed.: I.P. Guseva.

PURPOSE: The book may be useful to engineers working with automatic and remote control.

COVERAGE: This is a collection of 15 articles which were presented at the fourth and fifth scientific and technical conferences of young members of the Institute of Automation and Telemechanics of the USSR Academy of Sciences. The fourth conference was held in 1955 and the fifth in 1956. The material contained in the articles is based on research work done by young members of the Institute.

Card 1/8

Automation and Telemechanics (Cont.) SOV/1606

The articles discuss automatic and remote control devices and the automated drive. No personalities are mentioned. References appear at the end of each article.

TABLE OF CONTENTS:

AUTOMATIC CONTROL

Mel'tser, L.V. Selection of Operating Conditions for a Phase Ionization Flowmeter

The author discusses the design of a gas flowmeter measuring the phase shift of the ionization field created in a pipeline due to radioactive radiation. He also describes methods of selecting its operating conditions and obtains an expression for current sensitivity in a flowmeter. There are 5 references, 4 of which are Soviet, and 1 English.

SOV/112-59-5-9493

21(4)

Translation from: Referativnyy zhurnal. Elektrotekhnika, 1959, Nr 5, p 148 (USSR)

AUTHOR: Shumilovskiy, N N., and Mel'ttser, L. V.

TITLE: Methods for Raising the Dynamic Accuracy of Automatic Systems That Use Nuclear Radiation

PERIODICAL: Izv. vyssh. uchebn. zavedeniy. Priborostroyeniye, 1958, Nr 1, pp 49-55

ABSTRACT: Errors inherent to radiometric instruments that are due to the imperfections of instruments and to the statistical nature of radioactive decay are discussed, along with methods for reducing such errors. Use of compensation circuits is recommended as the most efficient means for raising the static and dynamic accuracies of an instrument. A compensating scheme with vibrating radiators is cited as an example; the scheme is used in an instrument for measuring pulp density. As the scheme comprises a mechanical follower, its dynamic properties remain low, nonetheless, despite the low

Card 1/2

Methods for Raising the Dynamic Accuracy of Automatic Systems That Use . . . .

static error. Improved schemes are considered in which an automatic calibration is realized by applying a reference input (Baldwin Institute's scheme for monitoring the thickness of a rolled piece and B. I. Verkhovskoy's schemes). A dynamic-compensated scheme of TsNII Chermet and B. I. Verkhovskoy's method of control signal are considered. Seven illustrations. Bibliography: 9 items.

A.A.R.

ZAKHAROV, Yu.G.; MEL'TSER, L.V.

Aerodynamic investigation of the method for measuring gas flow speeds based on the utilization of modulated radioactive radiation. Prom.aerodin. no.10:149-158 '58. (MIRA 11:8)
(Radioisotopes--Industrial applications) (Gas flow--Measurement)

24.6410,

S/058/62/000/009/005/069
A006/A101

AUTHORS: Shumilovskiy, N. N., Ageykin, D. I., Mel'tser, L. V.

TITLE: Magnetic modulation of radioactive radiation

PERIODICAL: Referativnyy zhurnal, Fizika, no. 9, 1962, 19, abstract 9B155 ("Dokl. L'vovsk. politekhn. in-ta", 1958, v. 2, no. 2, 212 - 215)

TEXT: The schematic diagram of modulating α and β-radioactive radiation by an electric or magnetic field is described. By varying the strength of the modulating field and the law of its variation, radioactive radiation pulses of required duration and shape can be obtained. The calculations presented show that only magnetic modulation of β-radiation is practically feasible. Data are given of a magnetic modulator with an induction of 0 ÷ 2,000 gauss in the operational gap.

[Abstracter's note: Complete translation]

Card 1/1

MEL'TTSER, L V

24(7); 28(1) PHASE I BOOK EXPLOITATION SOV/2650

Shumilovskiy, Nikolay Nikolayevich, and Lel' Vladimirovich Mel'ttser

Osnovy teorii ustroystv avtomaticheskogo kontrolya s ispol'zovaniyem radioaktivnykh izotopov (Fundamentals of the Theory of Automatic Control Systems Using Radioactive Isotopes) Moscow, Izd-vo AN SSSR, 1959. 141 p. Errata slip inserted. 5,000 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Institut avtomatiki i telemekhaniki.

Ed. and Ed. of Publishing House: B. I. Verkhovskiy; Tech. Ed.: S. G. Markovich.

PURPOSE: This book is intended for scientists, engineers, technicians, Aspirants and senior students engaged in planning, developing, and operating automatic control systems which utilize nuclear radiations.

COVERAGE: The book sets forth the theory, evaluation methods, and principal schematic diagrams of automatic control systems based on the utilization of nuclear radiation. The book is also an attempt to compile a handbook based on the authors' experience and that of other authors. The following are mentioned specifically: G. G. Iordan, on general problems in the utilization

Card 1/6

of radioactive isotopes in instrument making and level measurement; B. I. Verkhovskiy, on methods of increasing the accuracy of radiation intensity measurement and thickness measurement: L. K. Tatochenko, on automatic flaw detection with gamma rays and dynamic compensation; N. I. Shteynbok, on apparatus employing alpha radiation; K. S. Furman, on methods of density measurement; V. A. Yanushkovskiy and A. G. Vasil'yev, on relay control methods; and B. I. Yermolayev, on apparatus which utilize the backward scattering of beta radiation. The authors thank B. I. Verkhovskiy and L. K. Tatochenko for valuable counsel and comments, and L. A. Pivovarov for assistance in preparing the manuscript. There are 76 references: 72 Soviet and 4 English.

TABLE OF CONTENTS:

SOV/146-2-4-17/19

AUTHOR: Shumilovskiy, N.N. Doctor of Technical Sciences, Professor, Mel'ttser, L.V., Candidate of Technical Sciences

TITLE: Basic Construction Methods of Measuring Systems for Radioactive Instruments Automatically Controlling the Composition of a Substance.

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Priborostroyeniye, 1959, Nr 4, pp 137-148 (USSR)

ABSTRACT: This is a report read at an inter-vuz conference on electromeasuring instruments and technical means of automation, on November 12, 1958. It deals with the construction of systems automatically controlling the composition of a substance by means of radioactive isotope radiation. The control of binary mixtures by means of radiation damping or diffusion is considered. A simple damping system of gamma

Card 1/3

Basic Construction Methods of Measuring Systems for Radioactive Instruments Automatically Controlling the Composition of a Substance

radiation (Figure 1), and a simple system of inverse diffusion of beta radiation (Figure 3), are discussed. Multiple-component substances are controlled by means of radiation damping and diffusion using a rotating disc on which the radiation sources are mounted (Figure 4), as well as by means of an instrument (Figure 5) based on secondary radiation spectroscopy. In conclusion, the control method using neutron flows, e.g. the "activation analysis method" and the "radiation seizing method" /Reference 6/ are discussed. It is shown that, in order to obtain systems automatically controlling the composition of substances, it is necessary to develop receivers of high sensitivity to secondary radiations and low sensitivity to the primary neutron

Card 2/3

Basic Construction Methods of Measuring Systems for Radioactive Instruments Automatically Controlling the Composition of a Substance

flow. Quick-acting and simple spectrometers must be designed and computation techniques used to carry out combined measurements. This article was recommended by the Organization Committee of the inter-vuz conference on electro-measuring instruments and technical means of automation. There are 4 diagrams, 1 graph, and 6 Soviet references.

ASSOCIATION: Moskovskiy energeticheskiy institut (The Moscow Power Institute), Institut avtomatiki i telemekhaniki AN SSSR (The Institute of Automation and Telemechanics AS USSR).

SUBMITTED: February 14, 1959.

SHUMILOVSKIY, N.N., doktor tekhn.nauk; MEL'TTSER, L.V., kand.tekhn. nauk

Selecting optimum conditions for a receiver in units of automatic control of gas consumption by means of the method of tagged molecules. Izv.vys.ucheb.zav.; prib. no.6:109-113 '59. (MIRA 12:12)

1. Moskovskiy energeticheskiy institut.
(Gas meters) (Radioisotopes--Industrial applications)

PHASE I BOOK EXPLOITATION 807/4397

Nauchno-tekhnicheskoye priborostroitel'noy promyshlennosti

Priborostroyeniye i izmeritel'naya tekhnika (Instrument Manufacture and Measurement Technique) Moscow, Mashgiz, 1960. 462 p. Errata slip inserted. 5,000 copies printed.

Ed.: A.N. Gavrilov, Doctor of Technical Sciences, Professor; Tech. Ed.: A. Ya. Tikhanov; Managing Ed. for Literature on Machine and Instrument Construction (Mashgiz): N.V. Fotrovskiy, Engineer.

PURPOSE: This collection of articles is intended for scientific and technical personnel in the instrument industry.

COVERAGE: The 23 articles deal with the present state and the outlook for the development of instrument manufacture and measurement technique. New problems of design, construction, and manufacture of instruments are discussed in the first two sections. Emphasis is given to problems of automation and mechanization of production and to the application of new techniques in program control, ultrasonics, and chipless working of metals. The third section deals with new instrument methods involving the use of ultrasonics and radio isotopes. Some theoretical aspects of metrology and measurement technique are also discussed in this section. No personalities are mentioned. References accompany several of the articles.

AVAILABLE: Library of Congress

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10-24-60

Card 5/6

MEL'TTSER, L. V.

report to be presented at the 1st Intl Congress of the Intl Federation of Automatic Control, 25 Jun-5 Jul 1960, Moscow, USSR.

LERNER, A. Ya., - "The application of a self-adjusting system of
automatic control"
MALOV, V. S., FURK ICHIKOV, A. M., and [illegible] A. - "Industrial
telemeasurement systems and digital technique"
MEYEROV, M. V. - "Some peculiarities of the structure of multi-
communications regulation systems"
MIKHAYLOVSKIY, V. N. - "Evaluation indexes and the possibility of
increasing the quality of telemeasurement systems"
MIROVSKIY, V. V. - "Concerning the problem of established routines in
automatic regulation systems"
MICHKAZIND, K. A. "Principals of construction of digital double code
automatic compensators"
NEYMARK, Yu. I. - "Concerning the relation of systems of automatic
regulation with the parameters of periodic movements"
NIKOLAYEV, E. S., and EPSHTEYN, V. L. - "System of automatic control
of cutting of rolled metal on a continuous bar mill with the use
of digital calculating machines"
OBUKHTEEV, V. M. - "Some principles of organizing systems of complex
automation of large scale chemical production and optimization of these
systems"
OSTROVSKIY, G. M. - "Systems of automatic regulation with intermittent
change of parameters"
PEROV, V. P. - "Statistical synthesis of impulse systems"
PETROV, B. N. - "The invariant principle and its application in the
calculation of linear and nonlinear systems"
PIVEN, V. D. - "The problem of autonomy in the technique of automatic
control"
POPOV, E. P. - "Some problems of synthesis of automatic control non-
linear systems"
PUGACHEV, V. S. - "Method of determining the optimum system with non-
linear relation of the observed function with the parameters of the
signal"
PUGILLO, V. P., PETROV, V. V., KONDINOV, H. V., and VOLODIN, E. K. -
"Principles of construction of a single class of extra control
systems for automating production processes"
ROGINSKIY, V. N. - "The development of the theory of relay devices
in the USSR"
ROZENBLAT, M.A. - "Dynamic characteristics of cores with right angle
hysteresis winding and their influence on magnetic boosters"
ROZONER, L. I. - "Varied methods of investigating the quality of
automatic control systems"
RUSKINSKIY, V. M. - "Dynamics of automatic regulation of boiler-turbine
units"
SHUMILOVSKIY, N. N., MEL'TTSER, L. V., NAUMOV, A. A., MEN-CHZHI-CHZHUN,
and PIVOVAROV, L. A. - "Automatic control of composition of multi-
ingredient mixtures"
SHAGOVSKIY, E. S., and SEGALIN, V. G. - "Some results of work for the
utilization of radioactive radiation for automatic control of mining
machinery"
SOLODOVNIKOV, Y. V., BATKOV, A. M., BABURIN, V. M., VAL'DENBERG, Yu. S.,
MATVEYEV, P. S., and POKROVSKIY, A. K. - "Analyses and synthesis
of automatic control systems with the aid of calculating machine
facilities"
STAKHOVSKIY, R. I., FITSNER, L. N., and SHUBIN, A. B. - "Automatic
optimizers and their use for solution of variation problems in
automatic synthesis"
STRAKHOV, S. V. - "A system of alternating current electric drives with
autonomous power supply"
TAKSAR, I. M., and YANUSHEVSKIY, V. A. - "Apparatus for technical control
of production with the use of nuclear radiation"
TEODORCHIK, K. F., and BENDRIKOV, G. A. - "Methods of organizing the
trajectory of roots of linear systems and qualitative determination
of type of trajectory"
TSYPKIN, Ya. Z. - "Elements of the theory of digital automatic systems"
VERCHROVSKIY, D. B., KASHIRIN, V. A., CHUGIN, Yu. I., and SHASTOVA, G. A. -
"Static stability of telemeasurement"
VENIKOV, V. A. - "Interactions of a mathematical modeling and calculating
technology experiment in calculating loads in electrical systems"

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E032/E314

AUTHORS: Mel'ttser, L.V. and Shumilovskiy, N.N. (Moscow)

TITLE: Scientific Foundations of Automatic Methods of Control Using Nuclear Radiations

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskikh nauk, Energetika i avtomatika, 1960, Nr 1, pp 33-42 (USSR)

ABSTRACT: This paper is a report presented by Professor N.N. Shumilovskiy to a meeting of the Technical Section of the Ac.Sc., USSR, on September 29, 1959. According to the data published by the Institut ekonomiki AN SSSR (Institute of Economics of the Ac.Sc., USSR) the use of instruments employing radioactive materials in the control and automation of industrial processes led to a saving of about five hundred million roubles in 1958, while it was estimated that a wider application of already developed instruments would lead to a saving of four thousand million roubles per year. The present paper reviews some of the typical applications of radioactive isotopes. Among the examples considered are the measurement of the thickness or density of a material by measuring the absorption of radiation, ionisation liquid and gas-flow meters, automatic

Card1/5

Scientific Foundations of Automatic Methods of Control Using Nuclear Radiations

and continuous control of the composition of complex mixtures and so on. Statistical effects associated with the statistical nature of radioactive disintegrations are considered, as well as measures which can be taken in order to compensate for fluctuations in the detection efficiency. It is recommended that further developments in this field should be concerned with a) the control of the composition of complex substances and mixtures, b) automatic defectoscopy and c) methods based on the use of controlled neutron sources. It is suggested that the Academy of Sciences of the USSR should organise a special laboratory which would be concerned with scientific problems in this field. An interesting solution is given to the problem of the control of the composition of complex mixtures. If the medium under consideration is irradiated with beta particles, then one can observe secondary characteristic radiation and Bremsstrahlung. The spectrum of the

Scientific Foundations of Automatic Methods of Control Using Nuclear Radiations

characteristic emission is a line spectrum and depends only on the atomic number Z of the element. The energy E corresponding to the different lines in this spectrum is given by Moseley's law, which yields the following expression for the electron energy levels in an atom:

$$E \simeq Rhc \frac{(Z - k_{scr})^2}{n^2} \qquad (29)$$

where R is Rydberg's constant,
h is Planck's constant,
c is the velocity of light,
k_{scr} is the screening constant and
n is an integer.

The Bremsstrahlung is emitted owing to the interaction

Card 3/5

Scientific Foundations of Automatic Methods of Control Using Nuclear Radiations

between the incident fast electrons and the coulomb field of the atomic nuclei and forms a continuous spectrum with a well-defined maximum. The energy corresponding to the maximum is given by the empirical relation:

$$E = k_E (\rho d)^{0.2} Z^{0.7} \qquad (30)$$

where k_E is a coefficient which depends on the energy of the incident particles,

ρ is the density and

d is the thickness of the controlled substance.

The problem thus reduces to the separation of the various spectral lines characteristic of the given element. This is done with the aid of a special spectrometric device which measures the intensity of these lines and gives the relative concentration. Another possible method involves the use of neutrons. In this method nuclear reactions such

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Scientific Foundations of Automatic Methods of Control Using Nuclear Radiations

as (n, α) and (n, γ), which are accompanied by the capture of the neutrons and the emission of alpha particles and gamma rays, may be employed. The intensity of the radiation emitted on irradiation depends on the effective capture cross-section for the particular nuclear reaction and the number of atoms of the element taking part in the reaction.

There are 9 figures and 6 Soviet references.

SUBMITTED: November 14, 1959

Card 5/5

AUTHORS: Shumilovskiy, N. N., Doctor of Technical Sciences, Mel'ttser, L. V., Candidate of Technical Sciences

S/030/60/000/03/006/044
B015/B008

TITLE: Development of Automatic Control Methods by the Utilization of Nuclear Radiation

PERIODICAL: Vestnik Akademii nauk SSSR, 1960, Nr 3, pp 42-46 (USSR)

TEXT: The authors report on the spreading of these control methods in Soviet industry. The scientists O. N. Vavilov, I. M. Frank and B. I. Verkhovskiy of the Akademiya nauk SSSR (Academy of Sciences USSR) and V. A. Yanushkovskiy of the Akademiya nauk Latviyskoy SSR (Academy of Sciences of the Latvian SSR) participated in the elaboration of the fundamentals of these methods. Radioactive devices of special effect were designed at the institut Avtomatiki i telemekhaniki (Institute of Automation and Telemechanics) and the institut Gornogo dela (Institute of Mining). Differential- and compensation schemes are used in order to reduce apparatus errors. The compensation scheme with a radiation receiver is shown in figure 1 and the measuring diagram according to the control-signal method in figure 2. The measuring diagram according to the dynamic-compensation method is shown in figure 3. Comparatively simple devices in the

Card 1/2

Development of Automatic Control Methods by the Utilization of Nuclear Radiation

S/030/60/000/03/006/044
B015/B008

field of automatic control have already been prepared for serial production. The further development of science in this field requires however the carrying out of fundamental investigations. It is a question of solving the problem of a continuous and contactless control of the composition of complicated mixtures by the emission of electric pulses to the automatic control device. A great number of laboratory assistants carrying out quick analyses at present, could thus be made available for other tasks. It is considered necessary to establish a special laboratory for solving these complicated and important problems. There are 3 figures.

Card 2/2

SHUMILOVSKIY, N.N.; MEL'TTSER, L.V.; KALMAKOV, A.A.

Possibility of using secondary radiation occuring in a controlled atmosphere under the effect of beta particles to analyze the composition of nonferrous ore dressing products. Izv. vys. ucheb. zav.; tsvet. met. 3 no. 6:34-41 '60. (MIRA 14:1)

1. Institut avtomatiki i telemekhaniki AN SSSR. Krasnoyarskiy institut tsvetnykh metallov. Rekomendovana kafedroy obogashcheniya poleznykh iskopayemykh Krasnoyarskogo instituta tsvetnykh metallov.
(Ore dressing) (Beta rays--Industrial applications)

SHUMILOVSKIY, N.N.; MEL'TTSER, L.V.; KALMAKOV, A.A.; TENYAYEV, V.G.

Use of radioactive isotopes in fluorescent analysis for the automatic control of ore-dressing products. Izv. vys. ucheb. zav.; tsvet. met. 4 no.3:140-147 '61. (MIRA 15:1)

1. Institut avtomatiki i telemekhaniki AN SSSR i Krasnoyarskiy institut tsvetnykh metallov. Rekomendovana kafedroy obogashcheniya poleznykh iskopayemykh Krasnoyarskogo instituta tsvetnykh metallov.
(Ore dressing)
(Radioisotopes--Industrial applications)
(Fluorimetry)

MEL'TTSER, L. V., NAUMOV, A. A., and SHUMILOVSKIY, N. N.

"Joint Utilization of Different Processes of Interaction of Radiation With Matter for Automatic Control of Multicomponent Mixtures Compounds"

paper presented at the All-Union Seminar on the Application of Radioactive Isotopes in Measurements and Instrument Building, Frunze (Kirgiz SSR), June 1961)

So: Atomnaya Energiya, Vol 11, No 5, Nov 61, pp 468-470

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S/263/62/000/020/005/006
E194/E114

AUTHORS: Shumilovskiy, N.N., and Mel'ttser, L.V.

TITLE: The use of modulated radioactive radiation in the measurement of the volumetric flow and velocity of a gas

PERIODICAL: Referativnyy zhurnal, otdel'nyy vypusk, Izmeritel'naya tekhnika, no.20, 1962, 31-32, abstract 32.20.223. (Nauchn. zap. L'vovsk. politekhn. in-ta, no.79, 1961, 188-198)

TEXT: An apparatus is described for the determination of the average velocity of a gas from the time of transit of localised sets of ions produced by a modulated beam of β-particles in the gas under investigation. The modulation of the β-particle beam may be produced either by a suitable shutter or with the aid of a pulsating magnetic field. In the latter case the apparatus contains no moving parts. The detector consists of two plates which produce a transverse electric field in the duct through which the gas is flowing. The plates are insulated from the gas stream but cannot be screened. They are, therefore, pressed into

Card 1/4

special dielectric holders which are fitted into the metal walls of the duct. β-radiation is particularly suitable because of its good ionizing properties and penetrating power. In the case of γ-rays, a high-activity source is necessary, while the use of α-particles is difficult in view of their low penetrating power. In order to determine the ion density distribution along the axis of a particular bunch of ions, a graph is constructed for the energy spectrum of the β-radiation prior to the penetration of the wall of the duct. This graph is based on the following expression for allowed β-ray spectra:

$$N(E) = \xi F(z,w) \cdot w \cdot \sqrt{w^2 - 1} \cdot (E_{max} - E)^2,$$

where: $N(E)$ is the relative number of β-particles per unit energy interval; ξ is an arbitrary constant; $F(z,w)$ is the differential Fermi function; E is the kinetic energy of a β-particle; E_{max} is the maximum kinetic energy of the β-particles; w is the total energy of β-particles in units of the rest mass; and z is the atomic number of the nuclei undergoing the β-decay.

Card 2/4

Bloch's formula is used to calculate the losses in the walls of the duct. This formula is valid for thin absorbers with low atomic numbers and for β-rays with energies below 3 MeV. The number of ion pairs produced in the gas by the β-radiation is then obtained by a numerical integration of these expressions. Formulae are given for the reduction in the number of ions due to recombination and diffusion in the gas and absorption in the walls of the duct. Shockley's theorem is used to estimate the magnitude and form of the current pulses induced in the detector plates. The induced current is independent of the velocity of the gas and is equal to zero in the absence of an external field. The electric field distribution was simulated in an electrolytic tank, and the lines of force, the equipotential surfaces and the trajectories of two ion pairs moving in this field were deduced from the results obtained with the tank. Next, the formulae for the pulse current obtained from the Shockley theorem and the field distributions obtained with the electrolytic tank were used to construct graphs representing the current pulse shapes. Graphs and oscillograms of these current pulses are reproduced. A 35 μC source of Tl^{204} was

used. The dimensions of the source were 5 x 40 x 0.1 mm. The radiation pulses were each 0.002 sec long and the distance between the source and the detector was 50 cm. A special electronic circuit was developed for the continuous automatic measurement of the gas flow. Pulses from the detector plates were amplified and then fed into a Kipp relay. The latter produced output pulses whose length was equal to the average transit time of the ion packet in the gas. These pulses controlled the operation of a saw-tooth voltage generator. A peak voltmeter was connected to the anode of this generator through a cathode-follower. The readings of the voltmeter were proportional to the volumetric flow, which could be measured to an accuracy of ± 2%.
9 figures. 7 references.

[Abstractor's note: Complete translation.]

Card 4/4

MEL'TTSER, L. V., kand. tekhn. nauk

Seminar on radioisotope measurement technique. Vest. AN SSSR 33 no.1:112-113 Ja '63. (MIRA 16:1)

(Radioisotopes—Measurement)
(Radiation—Congresses)

SHUMILOVSKIY, N.N. (Moskva); MEL'TTSER, L.V. (Moskva); BRAUN, I.A. (Moskva)

Prospects of using the Mössbauer effect in automatic control.
Izv. AN SSSR. Tekh. kib. no.6:111-120 N-D '63. (MIRA 17:4)

SHUMILOVSKIY, N.N.; MEL'TTSER, L.V.; TENYAYEV, V.G.

Automatic control in ore dressing processes. Vest. AN SSSR 33 no.5:50-53 My '63. (MIRA 16:6)

(Ore dressing) (Automatic control)

AVEN, O.A.; DVORETSKIY, V.M.; DOMANITSKIY, S.M.; ZALMANZON, L.A.; KRASSOV, I.M.; KRUG, Ye.K.; TAL', A.A.; KHOKHLOV, V.A.; BULGAKOV, A.A.; DEMIDENKO, Ye.D.; BERNSHTEYN, S.I.; YEMEL'YANOV, S.V.; LERNER, A.Ya.; MEYEROV, M.V.; PEREL'MAN, I.I., FITSNER, L.N.; CHELYUSTKIN, A.B.; ZHOZHIKASHVILI, V.A.; IL'IN, V.A.; AGEYKIN, D.I.; GUSHCHIN, Yu.V.; KATYS, G.P.; MEL'TTSER, L.V.; PARKHOMENKO, P.P.; MIKHAYLOV, N.N.; FITSNER, L.N.; PARKHOMENKO, P.P.; ROZENBLAT, M.A.; SOTSKOV, B.S.; VASIL'YEVA, N.P.; PRANGISHVILI, I.V.; POLONNIKOV, D.Ye.; VOROB'YEVA, T.M.; DEKABRUN, I.Ye.

Work on the development of systems and principles of automatic control at the Institute of Automatic and Remote Control during 1939-1964. Avtom. i telem. 25 no. 6:807-851 Je '64. (MIRA 17:7)

L 25572-66 EWT(m)/EWP(t)/EWA(h) DIAAP JD

ACC NR: AM6013004 Monograph UR/

Shumilovskiy, Nikolay Nikolayevich; Retin, YUriy Pavlovich; Verkhovskiy, Boris Isaakovich; Kalmakov, Andrey Alekseyevich; Mel'ttser, Lel' Vladimirovich; Ovcharenko, YEvgeniy YAkovlevich

Radioisotope and X-ray spectral methods (Radioizotopnyye i rentgenospektral'nyye metody) Moscow, Izd-vo "Energiya", 1965. 190 p. illus., biblio. 4500 copies printed. Series note: Fizicheskiye i fizikokhimicheskiye metody kontrolya sostava i svoystv veshchestva

TOPIC TAGS: x-ray analysis, x-ray spectroscopy, x-ray technique, messbauer effect, radiation detection, neutron source

PURPOSE AND COVERAGE: The book is intended for people interested in radioisotopes and x-ray spectroscopy. It may also be useful for students specializing in spectroscopy and radioisotopes at technical schools of higher education. The first part of the book deals with the principles of operation, calculation methods, and design of radioisotope instruments, based on use of absorption and scattering effects of beta and gamma radiation, excitation of secondary radiation, and the use of neutron sources. The second part is devoted to methods of x-ray spectroscopy. Physical fundamentals of these methods are reviewed, ways for reducing measurement errors given,

Card 1/3 UDC 543.422.8:543.52

and examples of the industrial use of x-ray spectral analyzers discussed.

TABLE OF CONTENTS:

L 25572-66
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Card 3/3 Fw

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Improved methodology of chromatographic determination of γ-hexachlorocyclohexane in activated creolin and oil. Biul. Glav. bot. sada no.54:94-101 '64. (MIRA 17:11)

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